ANALYZING THE PROGRESS, PITFALLS AND PROSPECTS FOR ATTAINING ENVIRONMENTAL-RELATED SUSTAINABLE DEVELOPMENT GOALS IN NIGERIA

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ABSTRACT

The year 2020 was the resounding fifth anniversary of the 17 Sustainable Development Goals (SDGs) which have a vision for a safer, healthier and more prosperous world by 2030. The overall objective of this present research is to analyze Nigeria's strategies towards ascertaining their progress, pitfalls and prospects for achieving environmental sustainability. The novel Covid-19 pandemic is found out to be closely intertwined with tropical deforestation; hence, humans become exposed to disease pathogens originally found only in wild animals; thereby, depicting consequences for the environmental-related SDGs in Nigeria. In addition, Covid-19 measures such as mobility restrictions during lockdowns create major food supply system challenges thereby, affecting availability and accessibility requirements for the attainment of food security (SDG-2) in Nigeria. Hence, the novel Covid-19 is a colossal pitfall retarding progress on environmental-related SDGs in Nigeria amid the seven prospects as identified in this research article. Overall, the analysis shows that there is a gap between what can be achieved in the research domain regarding policy-making and implementation of environmental-related SDGs in Nigeria. As a way-forward, future researches are needed to investigate the effectiveness of implementing, monitoring and reporting system of the environmental-related SDGs towards attaining a safer, healthier and more prosperous Nigeria beyond 2030.

Keywords: Covid-19 pandemic, Environmental-related SDGs, Progress, Pitfalls, Prospects, Nigeria

INTRODUCTION

Building on the experiences of the Millennium Development Goals (MDGs) era, world leaders at the United Nations unanimously adopted the Transforming Our World in the 2030 Agenda for Sustainable Development, in September 2015 (United Nations Foundation, 2019). As such, a total of 17 Sustainable Development Goals (SDGs) were defined and ratified as a transformation pathway towards achieving the 2030 Agenda on Sustainable Development. The overall objective of the Global development Agenda was to produce a set of universal goals that meet the urgent environmental, political and economic challenges facing our world.

Remarkably, year 2020 was the resounding 5th year since 193 member countries ratified the 2030 global agenda on Sustainable Development at the United Nations General Assembly in September 2015. The 2030 agenda marked a milestone by which all countries, rich

and poor were not to be left behind in achieving social inclusion, economic growth and environmental sustainability (United Nations, 2020a). In support of the measurement and monitoring of progress of implementing the 2030 Global Agenda on Sustainable Development by the United Nations, the SDGs together with their associated Global Indicators and Targets (GIT) were defined as a blueprint with which a better and more sustainable future can be achieved for all humans (United Nations, 2020b).

For the United Nations member countriesto adequately implement development strategies and report on progress toward the 17 SDGs, the United Nations further established a Global Indicator Framework (GIF), designed around 232 SDG Indicators (Paganini *et al.*, 2018). These indicators represent the means by which national governments can practically monitor achievement on, and report progress towards each of the 169 targets of the 2030 agenda.

As climate change becomes one of the primary concerns for societies, the demand for quick solutions can lead to an over-reliance on carbon dioxide removal technologies and grey infrastructure which can further pose risks to biodiversity. Tropical forests are the hub of biodiversity. No wonder, the Paris Agreement calls for the enhancement of forest carbon stocks in developing countries (United Nations, 2015) thereby, supporting the reducing emissions from deforestation and forest degradation (REDD+) of the United Nations Framework. Consequently, the SDGs places sustainability at the heart of the Agenda 2030 and it recognizes the need that meeting environmental objectives is as vital as meeting social and economic objectives. Particularly, the SDGs present an opportunity to improving coherence across economic development and sustainable environmental management practices towards maintaining a balance between inclusive economic growth and sustainable use of natural resources (United Nations Foundation, 2019). Although, the 2020 Global SDGs ranking reports show that Nigeria is on track with respect to SDG 13 (Climate Action), issues such as deforestation and gas flaring still abound. Both deforestation and gas flaring contribute carbon emissions in Nigeria, thereby, further contributing to the rise in Global Average Surface Temperatures (GAST). Again, the success of the environmental-related SDGs in Nigeria depends on the active response of the Nigerian government to curbing the menace of the Covid-19 crisis. From literatures, it was asserted that increasing tropical deforestation exposes human beings to disease pathogens that have originally been endemic to wild animals, thereby, depicting consequences for the environmental-related SDGs in Nigeria (Interfaith Rainforest Initiative, 2020; Zhang, 2020). Specifically, in a compendium of research findings on various SDGs implementations in Nigeria, Anyogu *et al.* (2021) expresses the need to expand the knowledge base on the issue of sustainable development through research and development towards increasing the level of awareness of all and direct the policy makers and all stakeholders to ensuring an articulate decision-making process for a sound and safer Nigerian society. Nigeria was an implementer of the MDGs (2000 – 2015), and was among the 193 United Nations member countries that endorsed the 2030 Agenda in New York, USA in September 2015, which led to the adoption of the 17 SDGs. Thus, this present study attempts to answer the following two research questions: (i) How smooth has the Nigerian government hit the road towards the 2030 Agenda of Sustainable Development? (ii) What are the prospects that could effectively contribute to mitigating the pitfalls which are limiting against the progress of attaining the objectives of the environmental-related SDGs in Nigeria? Hence, the overall aim of this present study is to analyze Nigeria's strategies on the environmental-related SDGs towards delivering scientific and practical solutions that could enhance policy setting, monitoring and reporting environmental dimension pillar of the SDGs in Nigeria.

MATERIALS AND METHODS

Study Area: Nigeria is a Federal Republic with thirty-six States, a Federal Capital Territory (FCT), 774 Local Government Areas (LGAs). The States and the FCT both constitute the second tier of government while, the LGAs constitute the third tier of government. The 2020 recorded population value of Nigeria is 206,139,589

(Worldometers, 2020) on the basis of an approved annual population growth rate of 3.2 % from the 2006 National Population Census figure of 140 million.

Research Approach: This paper provides the outcomes of a systematic review of Nigerian government strategies for environmental-related SDGs towards ascertaining their progress, pitfalls and prospects for achieving environmental sustainability in the country beyond Year 2030. Bichi *et al.* (2021) had established the inter-links defining the environmental related SDGs that are being assessed in this study. A desk research was undertaken towards achieving the research objective of this study. According to Hague (2020), a desk research involves re-analyzing data from sources of information that do not involve a field survey. Hence, internet search was adapted. As pointed out by Winchester and Salji (2016), the internet is a very important source of data and literature collection. The main source of scientific information for this research was the freely available peer reviewed articles and technical reports available in a variety of reliable website pages on the internet.

This publication is organized into four sections: Section 1 presents a background information and rationale for attaining the environmental related SDGs in Nigeria. Section 2 describes the method that establishes the rigorous probabilistic framework presented in this present paper. Section 3 presents the results and discusses the findings on the subject matter. In section 4, the paper concludes by summing the key findings and proffering salient recommendations needed for future research on environmental-related SDGs in Nigeria.

RESULTS AND DISCUSSION

Historical trajectory of Global Sustainable Development Conceptualization: To start with, what does the term "development" being a keyword in the concept "sustainable development" mean? According to the Society for International Development (SID, 2018), the term 'development' is a process that creates growth, progress, positive change or the addition of physical, economic, environmental, social and demographic components. The purpose of development is to provide a rise in the level and quality of life of the population, and the creation or expansion of local or regional income and employment opportunities, without over-depleting the available environmental resources. Nevertheless, the effects of natural events combined with the ever-increasing human requirements for economic activities are putting high demands on resources of the environment; thereby, creating conflicts that result into over-depletion of natural resources beyond their carrying capacities. Such a situation prompted the United Nations to adopt the ideology of sustainable development.

The Brundtland Report (WCED, 1987), defines sustainable development (SD) as a development that meets the needs of present human generation without compromising the ability of future generations to meeting their own needs. Thus, the Brundtland Report, which is a document written by the World Commission on Environment and Development entitled "Our Common Future", underlines the concept of sustainable development as a necessary global developmental mechanism because: (i) the Earth has finite resources, (ii) humankind is increasingly efficient at the extraction and conversion of the Earth's resources and (iii) development and consumption patterns fundamentally become unsustainable with increasingly significant social, economic and political consequences. As a result, the aim of sustainable development would be to address the numerous aspirations of humans for better life without exceeding the carrying capacities of environmental resources found on Planet Earth.

Consequently, building upon the United Nations Agenda for Development, stakeholders at the United Nations General Assembly in 1997, adopted the Elkington Triple Bottom Line (ETBL) model which is defined as the interconnectivity among people, planet and profits (otherwise known as the 3Ps) into the definition of sustainable development. The ETBL model is an accounting framework that incorporates three dimensions of performance: economic development, social development and environmental protection (Slaper and Hall, 2011). Thus, the foregoing Elkington framework

dimensions became the fulcrum upon which the Millennium Development Goals (MDGs) were endorsed in Year 2000.

In September 2000, leaders of 189 countries gathered at the United Nations Headquarters and signed the historic Millennium Declaration, in which they committed to achieving a set of eight measurable goals popularly called the eight MDGs (UNDP, 2020). The MDGs of the previous 15 years (2000 – 2015) focused primarily on the needs for developing countries to commit themselves to halving extreme poverty and hunger towards promoting gender equality and reducing child mortality, as well as ensuring sustainable use of natural resources by the targeted date of 2015 (UNDP, 2012). African countries were adjudged to have made significant progress during the MDG period (2000 – 2015) (SDGCAFRICA, 2019).

One way to measure the progress of the SDGs is to focus on the "5Ps" of sustainable development, namely: People, Planet, Prosperity, Peace and Partnerships (United Nations, 2019). The 5Ps highlight how the SDGs are an intertwined framework instead of a group of siloes, in goal delivery.

In this SDGs era, countries are encouraged to measure, manage and monitor progress of the three SDGs dimensions, viz: economic, social and environmental sustainability. As such, progress on one P must balance and support progress on another. Based on the foregoing, the SDGs hinge on the basic notion of integrating the principles of sustainable development into national policies and processes based on the 5Ps and are illustrated hereunder (United Nations, 2019).

People: The SDGs declare the world's determination to end poverty and hunger, in all their forms and dimensions, and to ensure that all humans can fulfill their potential in dignity and equality and in a healthy environment.

Planet: The SDGs set a goal to protect the planet so it can support the needs of the present and future generations. Nearly every day we are seeing just how connected – and fundamental – climate change is to global development.

Prosperity: The SDGs aim to ensure that every human can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature. Inequality is one of the defining issues of this present human generation that requires a corresponding attention; which until date, such attention is lacking.

Peace: There can be no sustainable development without peace and no peace without sustainable development. Therefore, the SDGs encourage all humans to foster peaceful, just, and inclusive societies.

Partnership: The SDGs call for a spirit of strengthened global solidarity. Problems that cross geographies and sectors require effective collaboration towards solving common national problems by allies.

Assessing Nigeria's Progress on the Environmental SDGs: The current SDG Index score for Nigeria in the sustainable development report that was released in June 2020, is 49.30 and this score places Nigeria on the 160th global position out of the assessed 166 countries with Norway clinching the first position (globally) and Algeria (first in Africa with an SDG Index score of 72.30 at position 56/166) (Uinted Nations, 2020a). The SDG Index tracks the performances of a country on the 17 SDGs. The SDG Index was agreed by the international community in 2015 and equal weight is assigned to all the 17 global goals. The Nigeria's overall index score of 49.30 means that the country is on average 49 % of its way to attaining the best possible outcomes across the 17 SDGs. The rankings of African countries in the 2020 SDG Index Report are as presented in Table 1.

Recall that 193 countries ratified the 17 SDGs in 2015. Therefore, country performance index presented in Table 1 excludes 27 other countries in the World. Out of the 54 African countries recognized by the United Nations, the following five countries were excluded from the 2020 SDG report; Eritrea (Eastern Africa),

Table 1: Current status of Nigeria in comparison to other African countries of the 17 SDGs

SDG Global rank	African Country	2020 SDG Index Score	Position among African countries on SDGs Progress	Sub-regional Position
56	Algeria	72.3	1st	1st in North Africa
63	Tunisia	71.4	2nd	2nd in North Africa
64	Morocco	71.3	3rd	3rd in North Africa
83	Egypt	68.8	4th	4th in North Africa
82	Cabo Verde	67.2	5th	1st in West Africa
100	Ghana	65.4	6th	2nd in West Africa
108	Mauritius	63.3	7th	1st in East Africa
110	South Africa	63.4	8th	1st in Southern Africa
111	Gabon	63.4	9th	1st in Central Africa
115	São Tomé and Príncipe	62.6	10th	2nd in Central Africa
119	Namibia	61.6	11th	2nd in Southern Africa
121	Botswana	61.5	12th	3rd in Southern Africa
123	Kenya	60.2	13th	2nd in East Africa
125	Zimbabwe	59.5	14th	3rd in East Africa
127	Senegal	58.3	15th	3rd in West Africa
128	Côte d'Ivoire	57.9	16th	4th in West Africa
129	The Gambia	57.9	17th	5th in West Africa
130	Mauritania	57.7	18th	6th in West Africa
131	Tanzania	56.6	19th	4th in East Africa
132	Rwanda	56.6	20th	5th in East Africa
133	Cameroon	56.5	21st	3rd in Central Africa
135	Congo Brazzaville	55.2	22nd	4th in Central Africa
136	Ethiopia	55.2	23rd	6th in East Africa
137	Burkina Faso	55.2	24th	7th in West Africa
138	Djibouti	54.6	25th	7th in East Africa
140	Mozambique	54.1	26th	8th in East Africa
141	Lesotho	54.0	27th	3rd in Southern Africa
142	Uganda	53.5	28th	9th in East Africa
143	Burundi	53.5	29th	10th in East Africa
144	Eswatini	53.4	30th	4th in Southern Africa
145	Benin	53.3	31st	8th in West Africa
146	Comoros	53.1	32nd	11th in East Africa
147	Togo	52.7	33rd	9th in West Africa
148	Zambia	52.7	34th	12th in East Africa
149	Angola	52.6	35th	5th in Central Africa
150	Guinea	52.5	36th	10th in West Africa
152	Malawi	52.2	37th	13th in East Africa
153	Sierra Leone	51.9	38th	11th in West Africa
156	Mali	51.4	39th	12th in West Africa
157	Niger	50.1	40th	6th in Central Africa
158	DR of Congo	49.7	41st	7th in Central Africa
159	Sudan	49.6	42nd	5th in North Africa
160	Nigeria	49.3	43rd	13th in West Africa
161	Madagascar	49.1	44th	14th in East Africa
162	Liberia	47.1	45th	14th in West Africa
163	Somalia	46.2	46th	15th in East Africa
164	Chad	43.8	47th	8th in Central Africa
165	South Sudan	43.7	48th	16th in East Africa
166	Central African Republic	38.5	49th	9th in Central Africa

Source: modified from Page 26 – 27 of United Nations (2020a) and Worldometers (2020). Note: The SDG index score signifies a country's position between the worst (0) and the best target (100) outcomes of the 17 the UN Sustainable Development Goals

Guinea-Bissau (Western Africa), Equatorial Guinea (Central Africa), Libya (Northern Africa) and Seychelles (Eastern Africa). These countries were not included in the 2020 SDG Index due to insufficient data availability (United Nations, 2020b). In terms of Nigeria's progress towards the environmental-related SDGs, an overview highlighting the level and trends is presented in Figure 1.

Illustration in Figure 1 shows that Nigeria has not made a significant improvement in the progress of the SDGs implementation since 2015. For instance, it is only the SDG-13 outcomes in Nigeria which is adjudged to be 'on track' in the United Nations, (2020b) towards the realization by 2030 Agenda. In contrast, same SDG-13 acknowledged is in the same 2020 report, to have some challenges facing its implementation. This review will further elucidate on the specific challenges facing Nigeria in achieving the above listed environmental-related SDGs towards re-strategizing in the remaining 10 years of the SDGs implementations.

Analyzing Nigeria's Pitfalls on the Environmental-related SDGs: Implementation of the environmental-related SDGs in Nigeria is being plagued with numerous challenges. The Sustainable Development Report 2020 United Nations (2020b) identified a lack of clarity on environmental investments and further categorizes Nigeria's SDGs problems into three (Figure 1): (i) challenges, (ii) major challenges and (iii) significant changes. The challenges militating against the realization of the environmental-related SDGs in Nigeria are national security issues, oil spills in the Niger Delta, flooding and increasing deforestation. The foregoing highlighted challenges are further discussed below.

Impact of Insecurity on the Environmental-related SDGs: Aside militancy in the Niger Delta, rampant incidences of insurgency in Northeastern Nigeria and banditry within Northwestern and North central Nigeria; are the contemporary twin-problem contributing to limiting the actualization of many SDGs objectives in Nigeria. According to the recently released 2019 report on Global Terrorism Index, entitled: measuring the impact of terrorism (Institute for Economics and Peace, 2019), Nigeria was ranked third due to the high rates of killings and destructions perpetuated by the insurgents in Northeastern Nigeria. Banditry is another issue worth mentioning in this review. Within the north-central and north-western zones of Nigeria, there are incessant reports of bandits killing farmers and destroying maturing farm crops. Thus, the resulting consequences from the increasing Boko Haram and faceless banditry attacks are two-fold: one, their actions worsen food insecurity and malnutrition in affected regions of Nigeria; two, both groups of the criminal elements usually set-up their operation bases within forests thereby, further aggravating the following two environmental challenges in Nigeria. Ogbodo *et al.* (2016) had earlier reported that: (i) the social and economic values for people living around the forests areas which are currently used as operational bases for banditry and insurgency are limited and (ii) intense combats between military forces and insurgents/militants result into forest degradation. Forest degradation has direct impacts on global warming (short term) and climate change in the long-run. Climate change is currently the most serious environmental threats facing humankind.

Impact of Flooding on the Environmental-related SDGs: As a result of impacts of global climate change coupled with the incessant felling of mangroves and forests around sea and freshwater bodies in Nigeria, flooding has become a reoccurring environmental disaster in Nigeria. Nowadays, many Nigerian states usually experience increasing flooding between the months of June and October of every year. Indeed, flooding threatens the SDGs in Nigeria because it negatively affects the economy, social life and environment (Echendu, 2020). He further highlighted some specific impacts of flooding on the environmental-related SDG numbers 2, 6, 14 and 15 as follows: (a) SDG-2; impacts of flooding that usually led to scarcity of agricultural lands for cultivation of crops and rearing of livestock, because, arable lands are taken over by flood water; thereby, reducing food production, scarcity of food and increasing

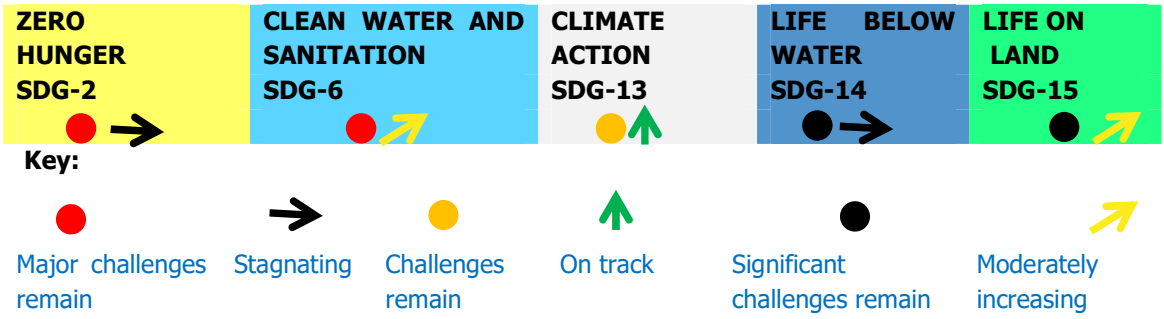

Figure 1: The 2020 recorded level and trends for SDGs progress in Nigeria (United Nations, 2020b)

food prices beyond the reach of ordinary Nigerians. (b) SDG-6; on rise in the groundwater level due to flooding which further reduces the efficacy of the natural water purification processes and increases risk of infections and vulnerability to dangerous chemicals. (c) SDG-14; flooding reduces the quality of natural water bodies as environmental wastes and fertilizers from farmlands are washed into the seas and rivers by flood waters. Hence, flooding can pollute aquatic ecosystem and causes deaths of aquatic life including negatively impacting on the reproduction and survival capabilities of aquatic animals. (d) SDG-15; target 15.8 aims at preventing the introduction of invasive alien species on land water ecosystems. Flooding facilitates the introduction of invasive alien species into Nigeria, because, dispersal seeds and other invasive plant materials are carried by flood water into non-native areas. In addition, some endemic wild animals are either killed or displaced by flooding.

Impact of Gas Flaring and Crude Oil Pollution in the Niger Delta Region: Nowadays, oil spills and gas flaring are the colossal environmental challenges facing Niger Delta communities hosting oil wells and natural gas fields in Nigeria. Natural gas flaring remains as old as the discovery of crude oil in Nigeria. According to the World Bank's global gas flaring reduction partnership rankings released in July 2020, Nigeria is the seventh largest gas flaring country, globally (World Bank, 2020). Environmental consequences associated with gas flaring have a calamitous effect on local populations, often resulting in polluted surrounding air (SDG-13) and groundwater quality (SDG-6) that ultimately leads to severe health crises (BudgIT, 2018) relating to malnutrition in SDG-2. Another issue is crude oil pollution of the Niger Delta communities. Oil leaks from pipelines in the Niger Delta continue to degrade arable lands for food production (SDG-2), destruction of mangrove forests, pollution of seas and brackish waters which further destroy aquatic life, especially fish production (SDG-14) (Osuagwu and Olaifa, 2018) and mangrove forests (SDG-15) (Interfaith Rainforest Initiative, 2020) thus leading to biodiversity loss.

Impact of Covid-19 on Environmental-related SDGs in Nigeria: A certain novel disease known as coronavirus (Covid-19) first emerged in China in December, 2019 (World Health Organization, 2020) and has become a contemporary global pandemic. Since February 2020, the novel Covid-19 has been exerting negative impacts on Nigerians. For example, with widespread transmission of the novel coronavirus, the Nigerian government resorted to a temporary lockdown of economic and social life. During the lockdown periods, many states experience a shorter-term risk of food shortages due to disruption in trade and supply chains (Reardon *et al.*, 2020; Vota, 2020). Beyond the most direct impacts on food security (SDG-2), Covid-19 pandemic has also brought about some temporary environmental benefits. Emissions of CO_2 in Nigeria dropped significantly due to reduced industrial activity, lower energy consumption and reduced transportation of material and people; thereby lowering the rate of global warming during the lockdowns in Nigeria.

Analyzing the Connection between Covid-19 and Tropical Deforestation in Nigeria: Generally, tropical forests are natural barriers shielding humans from zoonotic diseases such

as Covid-19. Hence, it is pertinent to widely protect our tropical forests and halt deforestation. Deforestation (i.e., conversion of forest land into other land cover types) is one way of bring humans in contact with zoonotic diseases (Interfaith Rainforest Initiative, 2020). As humans continue to encroach into forest ecosystems, they come into ever-greater contact with wildlife, thereby, enabling pathogens in wildlife to spill-over to livestock and humans, and, increasing the risk of emergence novel diseases as Covid-19. One more lesson surrounding the emergence of Covid-19, though still unclear, is that it was transmitted to human from a popular wildlife market in Wuhan. The situation report number 32 of the World Health Organization expresses that a particular wild animal was responsible for transferring the current ravaging variant of coronavirus to humans (World Health Orgainzation, 2020). Thus, Covid-19 is classified as a zoonotic disease. Zoonotic diseases are transmissible between animals and humans. The illegal trade in wildlife (popularly known as bush-meat in Nigeria) is another way through which humans increasing come in direct contact with disease-carrying organisms (Interfaith Rainforest Initiative, 2020).

Again, coronavirus also has a negative impact on the enforcement of environmental laws, especially regulations of deforestation activities, as log-poachers seem to have increased their illicit logging activities (Figure 2) because of loose enforcement by public authorities during the lockdown period.

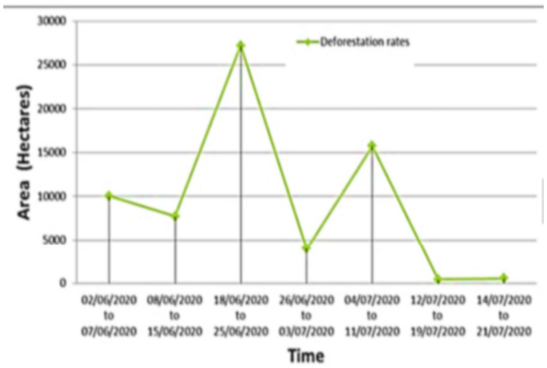

Figure 2: Nigeria's deforestation rate increased more during COVID-19 lockdown. *Source: Computed from Global Forest Watch Deforestation Data (GFW, 2020)*

Effective July 1, 2020, the Federal Government of Nigeria lifted restrictions on interstate travel and reopened some public offices. From Figure 2, it is observed that deforestation rates in Nigeria declined steadily close to the time when lockdown was first eased by government (July 3, 2030) and the time environmental enforcement picked up around July 12 – 14, 2020.

Analyzing Nigeria's Prospects on Environmental-related SDGs: To create a country which is more resilient to the foregoing human-induced challenges, it is necessary to reduce the greenhouse gas emissions that drive climate change; with a view to shielding vulnerable Nigerian populations from its consequences. Hence, four success stories are illustrated hereunder.

Nigeria Economic Recovery and Growth Plan (NERGP): In terms of policy backings, the Nigerian government launched its policy document entitled, Nigeria Economic Recovery and Growth Plan (NERGP) for 2017 – 2020. This is a federal government policy formulated as a medium-term development strategy that is expected to manage the country's economic transition from the current recession to the path of inclusive growth, sustainable development and a more assured trajectory of universal prosperity. The plan was forecasted to enable the government diversify the economic aspects of nation building, accelerate investments in infrastructure and human capital, while also promoting investment in key social sectors in order to create jobs and at the same time targeting reforms that will leverage the power of the private sector. However, a gap remained between what can be achieved in the research domain regarding policy-making and programmes implementations towards improving forest conservation and halting biodiversity loss (SDG-15) in Nigeria by 2030.

Formation of Nigeria Zero Hunger Forum (2017 – 2030): In support of SDG-2 implementation in Nigeria, a body known as the Nigeria Zero Hunger Forum (NZHF) with Secretariat at International Institute of Tropical Agriculture (IITA) was inaugurated in 2017 at the instance of World Food Programme (WFP), and the composition of NZHF enjoys a high political visibility, having former President of

Nigeria, Chief Olusegun Obasanjo, as the Convener and a number of State Governors as members of the Forum (Ayoola *et al*., 2018). The mandates of NZHF includes to catalyze and promote policy best practices required for meeting the SDG-2 targets while optimizing the use of available resources for the same purpose.

Establishment of Great Green Wall: This project acts as a defense against climate change (SDG-13) and combats desertification, contributes to restoring degraded arable land (SDG-15) in Nigeria. The Great Green Wall project is operational at locations classified as desertification frontline states of Nigeria and these locations are the following eleven (11) northern states of Adamawa, Bauchi, Borno, Gombe, Jigawa, Kano, Katsina, Kebbi, Sokoto, Yobe and Zamfara (FRNME, 2012).

Implementation of REDD+ Project in Nigeria: The first ever REDD+ implementation in Nigeria is ongoing at the Cross River National Park (CRNP). The duration is a two and a half years project. The goal of this programme is to enable Nigeria to contribute to climate change mitigation through improved forest conservation and enhancing sustainable community livelihoods (Ogbodo *et al*., 2016).

Earth Observation Data and Monitoring of SDGs in Nigeria: Bichi *et al.* (2021) reported that the component on measuring and monitoring of the SDGs occupies the bottom and largest part of the pyramid. This means that 'data' is of high relevance to tracking and recording the progress of the SDGs. Accordingly, the definition of the SDGs and the associated GIF represent the first truly data-driven framework in which countries can engage with the aim of evidence-based decision-making and development policies. The 2030 Agenda recognizes that 'if you can't measure it, you can't manage it' and data is the enabler for the 2030 Agenda implementation. Earth observations offer unprecedented opportunities to modernize national statistical systems and improve the capacities of countries to efficiently track all facets of sustainable development. Hence, with specific reference to SDG-15, remote sensing data can be used to monitor and report its targets and indicators of the environmental-related SDGs (Paganini *et al.,* 2018).

Despite the above highlights on the relevance of Earth Observation data to the SDGs monitoring, National Space Research and Development Agency (NASRDA) which is the national space agency of Nigeria for space science, currently has a weak potential to supporting the SDGs monitoring and reporting in Nigeria. This is because the capacity of NASDA to provide satellite data for environmental monitoring is grossly limited. Interestingly, the Federal Government of Nigeria signed a memorandum of understanding (MoU) with the Indian Space Research Organization (ISRO) in August, 2020 (MEAGI, 2020). This collaboration between Nigeria and India will bolster the capacity of NASRDA on monitoring and reporting the indicators of environmental-related SDGs in Nigeria using cheaper and readily available geospatial technologies.

Subnational Capacities for SDG Implementation and Reporting in Nigeria: Another priority is sub-national assessments of SDG progress, which can highlight disparities across cities, provinces, and regions within a country. Some state governments have appointed SDGs focal persons to coordinate the implementation of SDGs related programmes in their respective states. However, Kaduna State in Nigeria is one of the first subnational governments in the world to conduct an in-depth analysis of local SDGs data and strategy development to implement all 17 SDGs in the State. The outcome of the Kaduna statewide local SDGs analysis resulted into a report document; and was launched in 2017 as the first ever subnational SDG Report in Nigeria (United Nations, 2017). Emulation of Kaduna State Government's efforts by other states holds a promise for monitoring and reporting of SDGs implementations in Nigeria.

The Nigerian Meteorological Agency (NiMET) and SDGs: Just like the World Meteorological Organization (WMO), the Nigerian Meteorological Agency (NiMET) should be the technical co-custodian of SDG-13 (Climate Action) in Nigeria. The organizational

aim of NiMET is to observe Nigerian weather and climate and provide meteorological, hydrological and oceanographic services in support of national and international obligations. Therefore, below are practical illustrations of how NiMET contributes to the implementation of the environmental-related SDGs: (a) SDG-2: Through the annual seasonal rainfall prediction (SRP) (NiMET, 2020). Farmers, herders and fishers rely extensively on weather and climate services for anticipating and reducing risks, adapting crops, day-to-day and seasonal agrarian management, and maximizing productivity. Through their increasingly targeted services to the agricultural sector, NiMET's services are central to ensuring national food security. (b) SDG-6: NiMET observations and information on the hydrological cycle, including wetlands, aquifers, lakes, reservoirs and rainfall, are vital for sustainable water management. Therefore, data and analyses provided by NiMET and other hydrological service providers can also help to ensure that drinking water is safe and that human activities do not pollute aquatic ecosystems. (c) SDG-13: NiMET's mission includes providing the public with scientific facts and analyses of climate data which can help the citizenry to adequately adapt to climate change impacts and build climate resilience. In addition, NiMET is said to be firmly committed to supporting Nigeria actualize its nationally determined contributions in line with the Paris Climate Change Agreement. (d) SDG-14: NiMET and other national entities support Nigeria's efforts to monitor ocean temperatures, currents, salinity, acidification and surface levels – all major drivers of weather and climate. (e) SDG-15: NiMET provides essential data and forecasts that can support efforts to combat desertification and restore degraded land, including land affected by drought and floods. Furthermore, with a NiMET's hydrology monitoring support, the health of freshwater, forests and dry lands ecosystems can be enhanced for sustainable development interventions.

Final Outlook on Nigeria and The attainment of Environmental-related SDGs: Having analyzed the progress, pitfalls and prospects toward attaining environmental sustainability in Nigeria by 2030 and beyond, some basic inferences are made below.

With just nine years remaining to 2030, the Nigerian government is yet to convincingly meet a set of basic needs for environmental sustainability as shown in the recently released Nigeria's 2020 Voluntary National Review (VNR) on SDGs. In the 2020 VNR report, it can be observed that the development and funding priorities of the Federal Government exclude SDGs targets that can achieve environmental sustainability with respect to SDG-14 and SDG-15 (OSSAP-SDGs, 2020). Meanwhile, SDG-14 aims at conserving biodiversity in water bodies and SDG-15 focuses on promoting forest biodiversity. Forest biodiversity contributes to mitigating and adapting to the impacts of climate.

An additional obstacle is the loss of forest biodiversity: (i) large forest areas are cleared to pave way for some government infrastructural projects that are executed without adherence to environmental impact assessments (EIA) law, and (ii) many annual tree planting projects undertaken by governments are more in homogeneity at the expense of terrestrial biodiversity. Worst-still, the issues of increasing tropical deforestation coupled with indiscriminate poaching of wildlife have further exacerbated the scarcity of primates such as monkeys which are relevant research animals for trials of Covid-19 vaccines. For instance, Zhang (2020) asserts that more than 100 Covid-19 vaccines, therapies, and drugs were developed within the first seven months of the onset of the global Covid-19 pandemic. However, scientists in the United States of America expressed that the shortage of monkeys was slowing down Covid-19 vaccines research and trials. Hence, it is not enough for governments and individuals to only promote large scale mono-cropping activities such as planting of fast-growing tree species; to the detriment of terrestrial biodiversity (comprising of both fauna and flora species). In the meantime, Weisse and Goldman (2020) asserts that effective forest protection was hamstrung by a lack of political-will especially, in enforcing extant environmental laws.

Again, Nigeria's 2020 VNR suggests a National Development Plan (2021 – 2030) could be pivotal in advancing the achievement of the

SDGs in Nigeria. Whereas, government had failed to prioritize some realizable targets of environmental-related SDGs in the last five years. Nigerian policy actors' action of neglecting the environmental-related SDGs could have a corresponding negative effect on the actualization of the other development goals by 2030. Sustained neglect of the environmental SDGs by governments will spell doom for the country especially as there is an increasing infection rate of the ravaging Covid-19 pandemic. It is, therefore, imperative to bridge the gap between policy-making, implementation of environmental-related SDGs and forestry researches in Nigeria. Forestry related research to demonstrate disease surveillance and healthcare needs are ramped up in forest communities where many Nigerians come more in contact with wild animals that carry diseases such as Covid-19 pathogens (Bongaarts, 2019; Gibb *et al.*, 2020).

Although the 2020 global SDGs ranking reports show that Nigeria is on track for SDG 13 (Climate Action), issues such as deforestation and gas flaring still abound. Both deforestation and gas flaring can contribute to carbon emissions in Nigeria, and thus contributes to the Global Average Surface Temperatures. According to the latest Japan Meteorological Agency report (Tokyo Climate Center, 2020), the monthly anomaly of the global average surface temperature in June 2020 was +0.41°C above the 1981 – 2010 average value (Figure 3), and that, on a longer time scale, global average surface temperatures have risen at a rate of about 0.73°C per century.

According to the report, the temperature of June 2020 increased with +0.76°C above the 20th century average and was the 2nd warmest month in the history of global average surface temperature analyses. From Figure 3, the following five warmest years (anomalies) on record have all occurred in the past five years, since 2015 (i.e., the year SDGs started): 2015 (+0.41^{o}C), 2016 (+0.41^{o}C), 2017 (+36^{o}C), 2019 (+0.45°C) and 2020 (+0.41°C).

Consequently, another report published by the American Meteorological Society confirms that the last five years are among the six warmest years since the mid-1800s; and that greenhouse gases in the Earth's atmosphere were at their highest recorded levels between 2014 and 2019 (Blunden and Arndt, 2020).

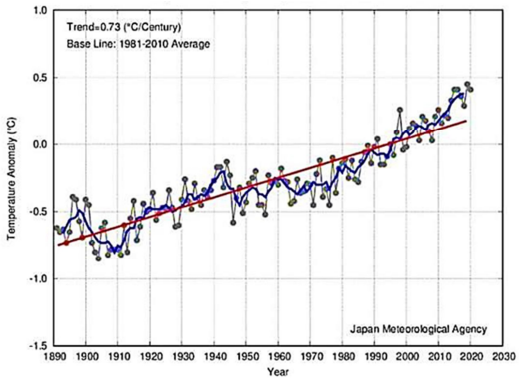

Figure 3: Monthly global average temperature anomalies in June, 2020 (Tokyo Climate Center, 2020). *Note: Anomalies are deviation from baseline (1981 – 2010 Average), the black thin line indicates surface temperature anomaly of each year, the blue line indicates their 5-year running mean, and the red line indicates the long-term linear trend*

Likewise, another report released by the National Centers for Environmental Information (NCEI) under the auspices of the United States of America's National Oceanic and Atmospheric Administration (NOAA), confirms that the year 2020 was the second-highest in the 141-year record of 1880 – 2020; at 1.02°C above the 20th-century average of 14.1°C in respect to global land and ocean surface temperature (Figure 4). This value is only 0.04°C shy of tying the record set in 2016 (NCEI, 2020).

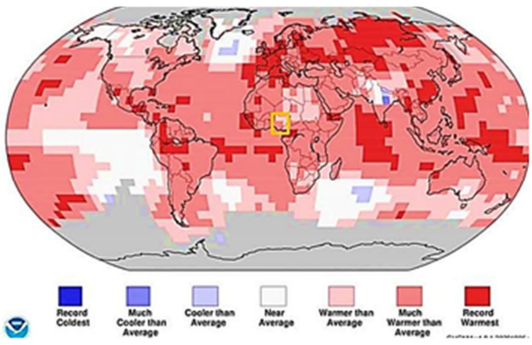

Figure 4: NOAA–NCEI's report on land and ocean surface temperatures for January to September, 2020. *Source: NCEI (2020)*

Figure 4 illustrates that Nigeria (in the yellow box) has dual categories of (i) warmer than average temperature at the Northern part and (ii) much warmer than average ocean temperature occurring in Southern Nigeria. Two reasons can justify the temperature variations

between the Northern and Southern parts of Nigeria as thus: (i) Southern states have closer proximity to the Atlantic Ocean than those in the North; and (ii) Increasing gas flaring in the Niger Delta region of the South contributes to the increases in land-ocean temperature.

Again, the success of the environmental-related SDGs in Nigeria depends on the active response of the Nigerian government to curbing the menace of the Covid-19 crisis. Findings by Naidoo and Fisher (2020) indicated that SDG-2 (Target 2.3), SDG-6 (Target 6.1), SDG-13 (Target 13.A) are fully threatened by Covid-19 while SDG-14 (Target 14.1) is partially threatened. Covid-19 also threatens and mitigates Target 15.7 of SDG-15 (Naidoo and Fisher, 2020). Thus, with the 2020 World Data Hub on the SDGs, efforts to leverage corporate environmental data to address the SDG data gap are highly imperative. A strengthened partnership between the private sector and government agencies is essential to ensure Covid-19 recovery pathways are inclusive and in line with efforts to achieve the SDGs by 2030.

Lastly, a serious issue bedeviling Nigeria is the case of an age-old plague known as corruption at high public places, in which public officials divert funds into their private pockets, thereby causing underdevelopment and impoverishing the generality of citizens. Corruption has been a long-standing source of distrust and anger in Nigeria. If left unabated, this cankerworm in the words of the Secretary General of the United Nations, António Guterres: "has the potential to seriously undermine good governance around the world and, to send us even farther off-track in our work to achieve the SDGs (United Nations, 2020). Therefore, there is a dire need to combat corruption with new heights of resolve relating to the creation of robust systems for accountability, transparency and integrity across the three tiers of governments in Nigeria.

Conclusion: In this paper, the Nigerian government strategies for environmental-related SDGs were analyzed towards ascertaining their progress, pitfalls and prospects for achieving environmental sustainability in the country by 2030. The findings indicated that the novel Covid-19 pandemic is closely intertwined with tropical deforestation; hence, humans become exposed to disease pathogens originally found only in wild animals; thereby, depicting consequences for the environmental-related SDGs in Nigeria. Besides, Covid-19 measures such as mobility restrictions during lockdowns create major food supply system challenges thereby, affecting availability and accessibility requirements for the attainment of food security (SDG-2) in Nigeria. Hence, the novel Covid-19 is a colossal pitfall retarding progress on environmental-related SDGs amid the above seven identified prospects in Nigeria.

With just nine years remaining to achieve the 2030 Agenda, the Federal Government of Nigeria is yet to convincingly meet a set of basic needs for environmental sustainability. Overall, the analysis above shows that there is a gap between what can be achieved in the research domain regarding policy-making and implementation of environmental-related SDGs in Nigeria. Hence, the outcomes of this present study are required to raise awareness among relevant Nigerian stakeholders on the significance of implementing and monitoring the environmental-related SDGs.

As a way-forward, future researches are needed to investigate the effectiveness of implementing, monitoring and reporting system of the environmental SDGs towards attaining a safer, healthier and more prosperous Nigeria by 2030.

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